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TEST REPORT

Report No. ..... :	**CHTEW22080306** Report Verification:
Project No.....:	**SHT2207038406EW**
FCC ID..... :	**2A783-DTPMS006**
Applicant's name..... :	**Wuhan Huchuang Union Technology Co., Ltd.**
Address.....:	No. 1 Workshop, 1F, Building B10, Wuhan Hi-tech Medical Device Park, No. 818 Gaoxin Avenue, East Lake Hi-tech Development Zone, Wuhan, Hubei, China
Test item description ..... :	**Data transceiving & Power Monitoring series**
Trade Mark .....:	Metice
Model/Type reference.....:	MT1100
Listed Model(s) .....:	MT500 ,MT700
Standard ..... :	**FCC CFR Title 47 Part 15 Subpart C Section 15.231**
Date of receipt of test sample.....:	Jul.21, 2022
Date of testing.....:	Jul.21, 2022- Oct.13, 2022
Date of issue.....:	Oct.14, 2022
Result..... .....:	**PASS**

Compiled by (position+printedname+signature)...:	File administrators Fanghui Zhu	Fanghui Zhu
Supervised by (position+printedname+signature)....:	Project Engineer Caspar Chen	Caspar Chen
Approved by (Position+Printed name+Signature):	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd.**
Address.....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Contents

1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

– FCC Rules Part 15.231(e): Periodic operation in the band 40.66–40.70 MHz and above 70 MHz.

– ANSI C63.10:2013: American National Standard for Testing Unlicensed Wireless Devices

1.2. Report version

Revision No.	Date of issue	Description
N/A	2022-10-14	Original

2. TEST DESCRIPTION

Report clause	Test Items	Standard Requirement	Result	Test Engineer
5.1	Antenna Requirement	15.203	PASS	Xiaoqin Li
5.2	AC Conducted Emission	15.207	PASS	Junman Wang
5.3	20dB Bandwidth	15.231(c)	PASS	Xiaoqin Li
5.4	99% Occupied Bandwidth	-	N/A	N/A
5.5	Silent period time	15.231(e)	PASS	Xiaoqin Li
5.6	Duty cycle corrected factor	-	PASS*1	Xiaoqin Li
5.7	Field strength of the Fundamental signal	15.231(e)	PASS	Quanhai Deng
5.8	Radiated Spurious Emission	15.231(e)/15.205/15.209	PASS	Pan Xie

Note:

– The measurement uncertainty is not included in the test result.

– *1: No requirement on standard, only report these test data.

3. SUMMARY

3.1. Client Information

Applicant:	Wuhan Huchuang Union Technology Co., Ltd.
Address:	No. 1 Workshop, 1F, Building B10, Wuhan Hi-tech Medical Device Park, No. 818 Gaoxin Avenue, East Lake Hi-tech Development Zone, Wuhan, Hubei, China
Manufacturer:	Wuhan Huchuang Union Technology Co., Ltd.
Address:	No. 1 Workshop, 1F, Building B10, Wuhan Hi-tech Medical Device Park, No. 818 Gaoxin Avenue, East Lake Hi-tech Development Zone, Wuhan, Hubei, China
Factory:	Wuhan Huchuang Union Technology Co., Ltd.
Address:	No. 1 Workshop, 1-2F, Building B10, Wuhan Hi-tech Medical Device Park, No. 818 Gaoxin Avenue, East Lake Hi-tech Development Zone, Wuhan, Hubei, China

3.2. Product Description

Main unit information:	
Product Name:	Data transceiving & Power Monitoring series
Trade Mark:	Metice
Model No.:	MT1100
Listed Model(s):	MT500 ,MT700
Power supply:	DC 3.7V from Battery
Hardware version:	MT1100_V1_4
Software version:	MT1100_SV1.2
Accessory unit information:	
Battery information:	Model: 1S2P18650 Capacity: 5000mA(18.5Wh)
Adapter information:	Model: MIA-11UA Input: 100-240V AC ,50-60Hz 0.4A Output: 5VDC，2.1A 10.5W

3.3. Radio Specification Description

Operation frequency:	425-445MHz
Modulation:	FSK, GFSK
Channel number:	21
Channel separation:	1MHz
Antenna type:	Rubber rod folding antenna
Antenna gain:	3 dBi

3.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	
Connect information:	Phone: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC	762235

4. TEST CONFIGURATION

4.1. Test frequency list

According to section ANSI C63.10 section 5.6.1,

Measurements of unlicensed wireless devices shall be performed and, if required, reported for each band in which the EUT can be operated with the device operating at the number of frequencies in each band specified in Table 4

Table 4—Number of frequencies to be tested

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

So test frequency as follow:

Channel	Frequency (MHz)
01	**425**
02	426
. :	. :
09	**433**
. :	. :
20	444
21	**445**

4.2. Descriptions of Test mode

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The EUT was set to connect with large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report.

4.3. Test sample information

Test item	HTW sample no.
RF Conducted test items	Please refer to the description in the appendix report
RF Radiated test items	YPHT22070384014
EMI test items	N/A

Note:

RF Conducted test items: 20dB Bandwidth ,99% Occupied Bandwidth, Silent period time, Duty cycle corrected factor

RF Radiated test items: Field strength of the Fundamental signal

EMI test items: AC Conducted Emission

4.4. Support unit used in test configuration and system

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Whether support unit is used?			
✓ No			
Item	Equipment	Trade Name	Model No.
1			
2			

4.5. Testing environmental condition

Type	Requirement	Actual
Temperature:	15~35°C	25°C
Relative Humidity:	25~75%	50%
Air Pressure:	860~1060mbar	1000mbar

4.6. Statement of the measurement uncertainty

Test Item	Measurement Uncertainty
AC Conducted Emission (150kHz~30MHz)	3.00 dB
Radiated Emission (30MHz~1000MHz	4.36 dB
Radiated Emissions (1GHz~25GHz)	5.10 dB
Peak Output Power	0.77dB
Power Spectral Density	0.77dB
Conducted Spurious Emission	0.77dB
6dB Bandwidth	70Hz for <1GHz 130Hz for >1GHz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4.7. Equipment Used during the Test

● Conducted Emission							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Shielded Room	Albatross projects	HTWE0114	N/A	N/A	2018/09/28	2023/09/27
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2022/08/30	2023/08/29
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2022/08/29	2023/08/28
●	Pulse Limiter	R&S	HTWE0193	ESH3-Z2	101447	2022/08/29	2023/08/28
●	RF Connection Cable	HUBER+SUHNER	HTWE0113-02	ENVIROFLEX_142	EF-NM-BNCM-2M	2022/09/17	2023/09/16
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-6th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2018/09/30	2023/09/29
●	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2022/08/30	2023/08/29
●	Loop Antenna	R&S	HTWE0170	HFH2-Z2	100020	2021/04/06	2024/04/05
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0123	VULB9163	538	2021/04/06	2024/04/05
●	Pre-Amplifer	SCHWARZBECK	HTWE0295	BBV 9742	N/A	2021/11/05	2022/11/04
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-01	N/A	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-02	SUCOFLEX104	501184/4	2022/02/25	2023/02/24
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-7th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	C11121	2018/09/27	2023/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2022/08/25	2023/08/24
●	Horn Antenna	SCHWARZBECK	HTWE0126	9120D	1011	2020/04/01	2023/03/31
●	Broadband Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	BBHA9170472	2020/04/27	2023/04/26
●	Pre-amplifier	CD	HTWE0071	PAP-0102	12004	2021/11/05	2022/11/04
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2022/02/28	2023/02/27
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-01	6m 18GHz S Serisa	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-02	6m 3GHz RG Serisa	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0119-05	6m 3GHz RG Serisa	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-04	6m 3GHz RG Serisa	N/A	2022/02/25	2023/02/24
●	Test Software	Audix	N/A	E3	N/A	N/A	N/A

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	HTWE0242	FSV40	100048	2022/08/25	2023/08/24
●	Signal & Spectrum Analyzer	R&S	HTWE0262	FSW26	103440	2022/08/25	2023/08/24
●	Spectrum Analyzer	Agilent	HTWE0286	N9020A	MY50510187	2022/08/25	2023/08/24
●	Radio communication tester	R&S	HTWE0287	CMW500	137688-Lv	2022/08/25	2023/08/24
●	Test software	Tonscend	N/A	JS1120	N/A	N/A	N/A

5. TEST CONDITIONS AND RESULTS

5.1. Antenna Requirement

Requirement

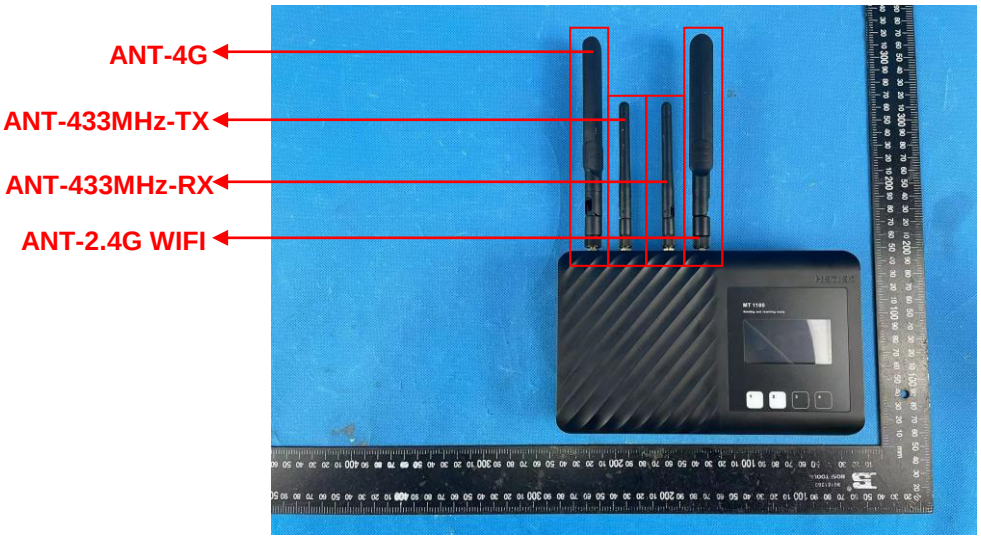
FCC CFR Title 47 Part 15 Subpart C Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

TEST RESULT

☒ **Passed** ☐ **Not Applicable**

The antenna type is a Rubber rod folding antenna, the directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



5.2. AC Conducted Emission

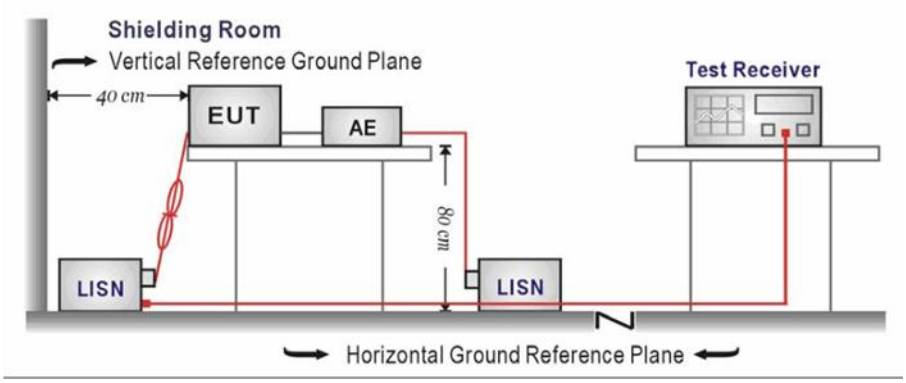
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

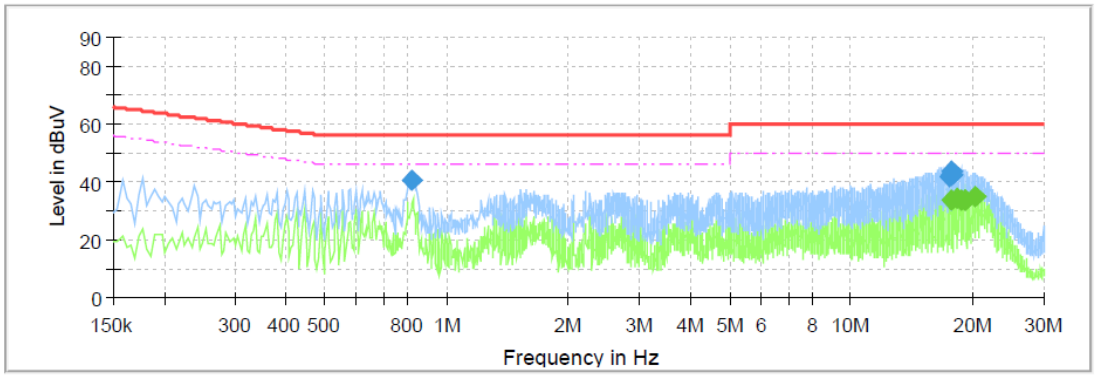
TEST MODE:

Please refer to the clause 4.2

TEST RESULT

☒ **Passed** ☐ **Not Applicable**

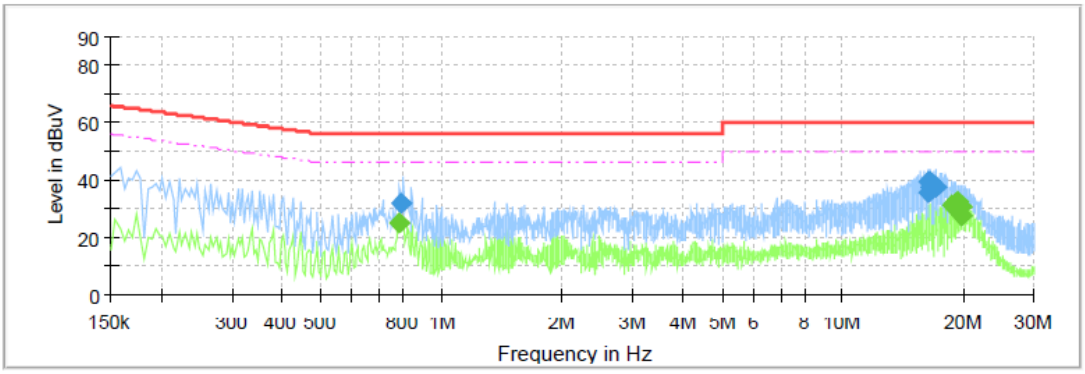
Test Line:	L



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.822500	40.40	---	56.00	15.60	L1	10.1
17.490500	41.84	---	60.00	18.16	L1	10.7
17.622500	42.23	---	60.00	17.77	L1	10.7
17.626500	42.59	---	60.00	17.41	L1	10.7
17.646500	42.29	---	60.00	17.71	L1	10.7
17.714500	---	33.91	50.00	16.09	L1	10.7
17.714500	43.55	---	60.00	16.45	L1	10.7
18.334500	---	34.10	50.00	15.90	L1	10.7
18.670500	---	33.71	50.00	16.29	L1	10.8
19.138500	---	34.00	50.00	16.00	L1	10.8
19.158500	---	33.82	50.00	16.18	L1	10.8
20.154500	---	35.28	50.00	14.72	L1	10.8

Test Line:	N



Final_Result

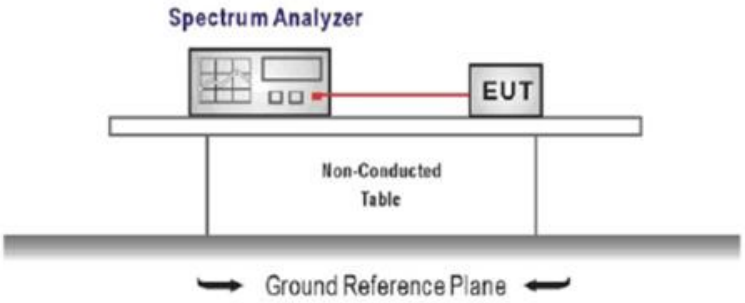
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.779500	---	24.94	46.00	21.06	N	10.2
0.791500	32.05	---	56.00	23.95	N	10.2
16.299500	35.49	---	60.00	24.51	N	10.6
16.383500	39.18	---	60.00	20.82	N	10.6
16.447500	39.19	---	60.00	20.81	N	10.6
16.467500	37.32	---	60.00	22.68	N	10.6
17.015500	37.74	---	60.00	22.26	N	10.6
18.775500	---	31.42	50.00	18.58	N	10.7
19.219500	---	31.88	50.00	18.12	N	10.7
19.263500	---	32.45	50.00	17.55	N	10.7
19.767500	---	27.38	50.00	22.62	N	10.7
19.815500	---	30.82	50.00	19.18	N	10.7

5.3. 20dB bandwidth

LIMIT

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900 MHz.
For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
   Center Frequency = channel center frequency
   Span= approximately 2 to 3 times the 20 dB bandwidth
   RBW = 3 kHz, VBW ≥ 3 × RBW
   Sweep time= auto couple
   Detector = Peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission, and record the pertinent measurements.

TEST MODE:

Please refer to the clause 4.2

TEST RESULT

☒ **Passed** ☐ **Not Applicable**

TEST DATA

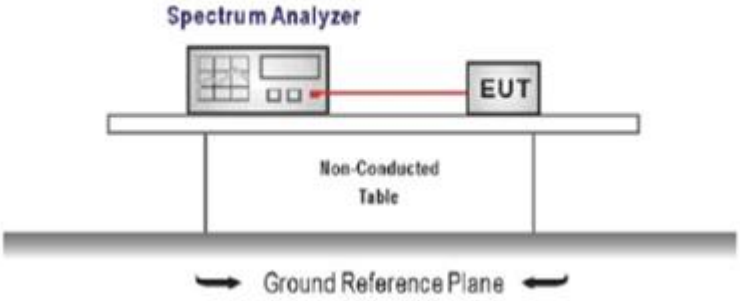
Please refer to appendix A on the appendix report

5.4. 99% Occupied Bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output andthe spectrum analyzer).
   Center Frequency =channel center frequency
   Span≥1.5 x OBW
   RBW = 1%~5%OBW
   VBW ≥ 3 × RBW
   Sweep time= auto couple
   Detector = Peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.

TEST MODE:

Please refer to the clause 4.2

TEST RESULT

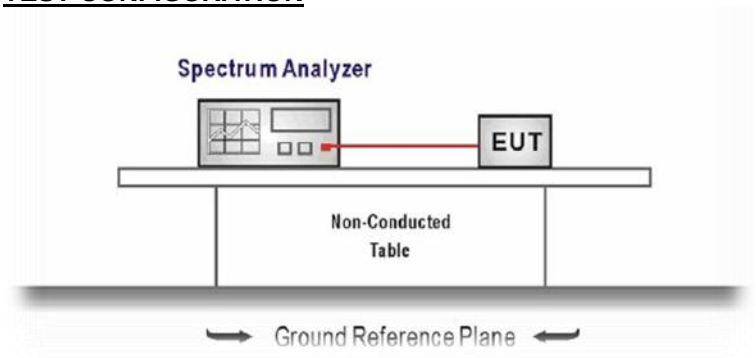
☐ **Passed** ☒ **Not Applicable**

5.5. Silent Period Time

LIMIT

Devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be **at least 30 times the duration of the transmission but in no case less than 10 seconds**

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
   Frequency=Center carrier frequency
   RBW=1MHz, VBW=3MHz, Span= zero,
   Sweep time= 40second, Detector function = peak, Trace = single
4. Measure and record the results in the test report.

TEST MODE:

Please refer to the clause 4.2

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

TEST DATA

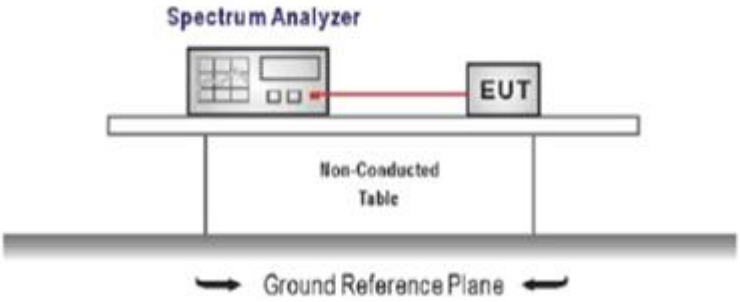
Please refer to appendix B on the appendix report

5.6. Duty Cycle Corrected Factor

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
   Span=zero span, Frequency=centered channel, RBW= 1MHz, VBW ≥ RBW
   Sweep time=as necessary to capture the entire dwell time,
   Detector function = peak, Trigger mode
4. Measure and record the duty cycle data

TEST MODE:

Please refer to the clause 4.2

TEST DATA

Please refer to appendix C on the appendix report

5.7. Radiated field strength of the fundamental signal

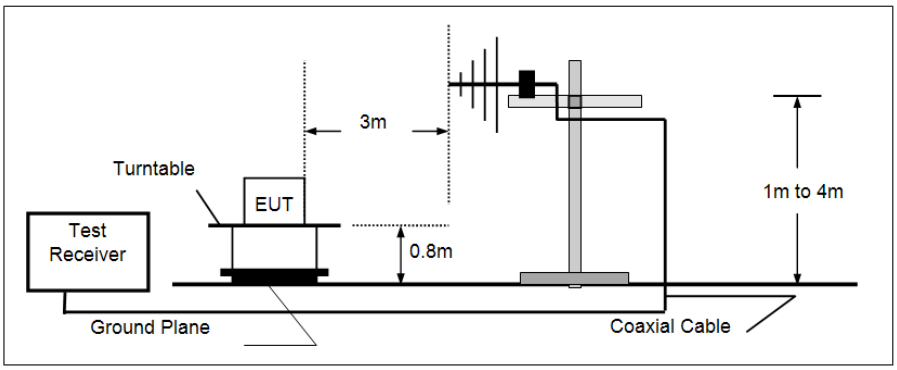
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.231(e)

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500[1]	50 to 150[1]
174-260	1,500	150
260-470	1,500 to 5,000[1]	150 to 500[1]
Above 470	5,000	500

[1]Linear interpolations.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1GHz, The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
   a) Span shall wide enough to fully capture the emission being measured;
   b) RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
   If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

TEST MODE:

Please refer to the clause 4.2

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Note:

1) Level= Reading + Factor; Factor =Antenna Factor+ Cable Loss- Preamp Factor
2) Over Limit = Level - Limit

Test channel	CH_{01}	Polarity	Horizontal

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	424.98	60.78	15.22	9.26	0.00	85.26	92.57	-7.31	Peak

Test channel	CH_{01}	Polarity	Vertical

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	425.04	57.77	15.23	9.26	0.00	82.26	92.57	-10.31	Peak

Test channel	CH_{09}	Polarity	Horizontal

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	433.00	60.45	15.36	9.30	0.00	85.11	92.84	-7.73	Peak

Test channel	CH_{09}	Polarity	Vertical

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	433.00	61.63	15.36	9.30	0.00	86.29	92.84	-6.55	Peak

Test channel	CH_{21}	Polarity	Horizontal

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	445.05	63.38	15.57	9.35	0.00	88.30	93.22	-4.92	Peak

Test channel	CH_{21}	Polarity	Vertical

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	445.05	65.15	15.57	9.35	0.00	90.07	93.22	-3.15	Peak

Fundamental of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Over Limit [dB]	Polarity
1	424.98	85.26	-33.85	51.41	72.57	-21.16	Horizontal
2	425.04	82.26	-33.85	48.41	72.57	-24.16	Vertical
1	433.00	85.11	-33.85	51.26	72.84	-21.58	Horizontal
2	433.00	86.29	-33.85	52.44	72.84	-20.40	Vertical
1	445.05	88.30	-33.85	54.45	73.22	-18.77	Horizontal
2	445.05	90.07	-33.85	56.22	73.22	-17.00	Vertical

5.8. Radiated Spurious Emission

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.231(e)

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500[1]	50 to 150[1]
174-260	1,500	150
260-470	1,500 to 5,000[1]	150 to 500[1]
Above 470	5,000	500

[1]Linear interpolations.

FCC CFR Title 47 Part 15 Subpart C Section 15.209

Frequency	Limit (dBuV/m)	Value
0.009 MHz ~0.49 MHz	2400/F(kHz) @300m	Quasi-peak
0.49 MHz ~ 1.705 MHz	24000/F(kHz) @30m	Quasi-peak
1.705 MHz ~30 MHz	30 @30m	Quasi-peak

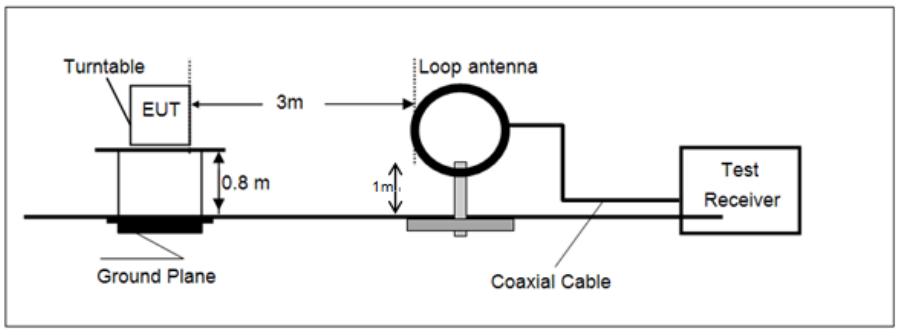
Note: Limit dBuV/m @3m = Limit dBuV/m @300m + 40*log(300/3)= Limit dBuV/m @300m +80,

Limit dBuV/m @3m = Limit dBuV/m @30m +40*log(30/3)= Limit dBuV/m @30m + 40.

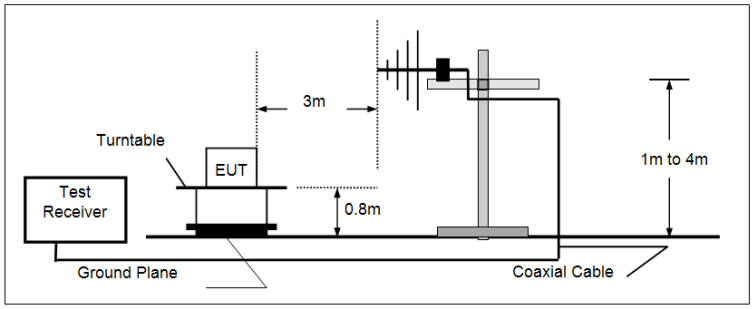
Frequency	Limit (dBuV/m @3m)	Value
30MHz~88MHz	40.00	Quasi-peak
88MHz~216MHz	43.50	Quasi-peak
216MHz~960MHz	46.00	Quasi-peak
960MHz~1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

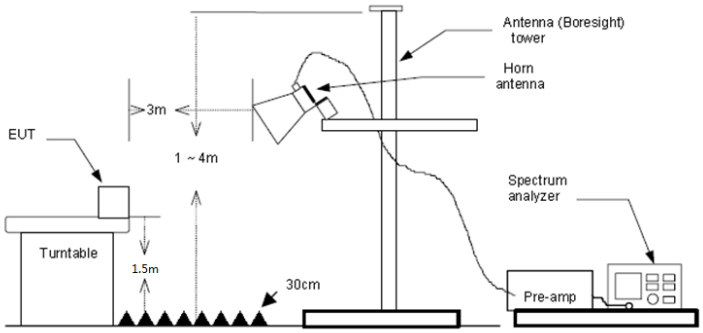
- 9 kHz ~ 30 MHz



- 30 MHz ~ 1 GHz



- Above 1 GHz



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
   a) Span shall wide enough to fully capture the emission being measured;
   b) Below 1 GHz:

      RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;

      If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
   c) Set RBW=1MHz, VBW=3MHz for >1GHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement

      For average measurement:

      Average level = Peak level – DCCF

TEST MODE:

Please refer to the clause 4.2

TEST RESULT

☒ **Passed** ☐ **Not Applicable**

Note:

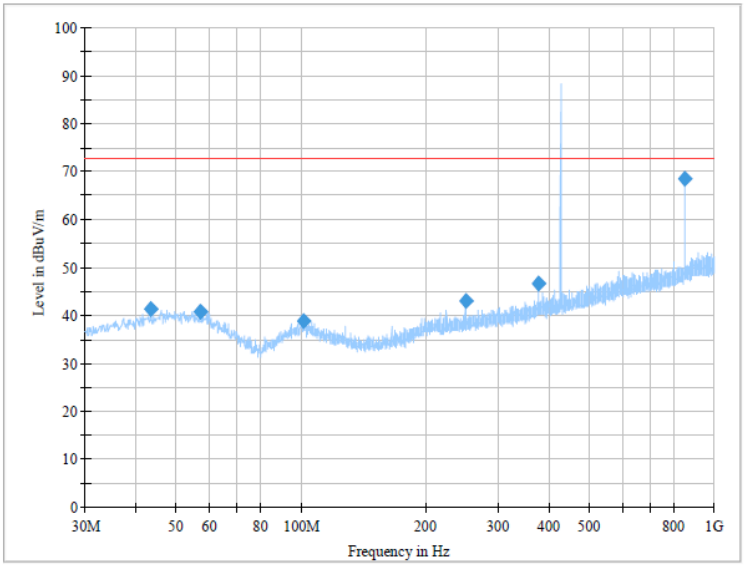
1) Level= Reading + Factor/Transd; Factor/Transd =Antenna Factor+ Cable Loss- Preamp Factor
2) Margin = Limit – Level
3) Over Limit = Level - Limit

FOR 9 kHz ~ 30 MHz

The EUT was pre-scanned this frequency band, found the radiated level 20dB lower than the limit, so don't show data on this report.

FOR 30 MHz ~ 1000 MHz

Test channel	CH_{01}	Polarity	Horizontal

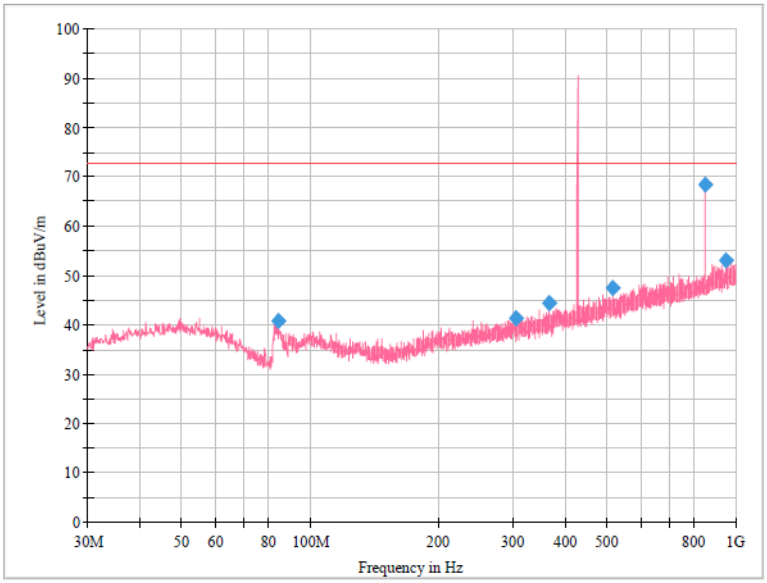


Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
43.337500	41.43	72.57	31.14	100.0	H	0.0	20.4
57.038750	40.86	72.57	31.71	100.0	H	182.0	20.2
101.416250	38.96	72.57	33.61	100.0	H	222.0	18.9
250.068750	43.13	72.57	29.44	100.0	H	35.0	20.1
375.077500	46.74	72.57	25.83	100.0	H	28.0	23.3
850.013750	67.63	72.57	4.94	100.0	H	234.0	31.0

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	850.01375	67.63	-33.85	33.78	52.57	-18.79	Horizontal

Test channel	CH_{01}	Polarity	Vertical

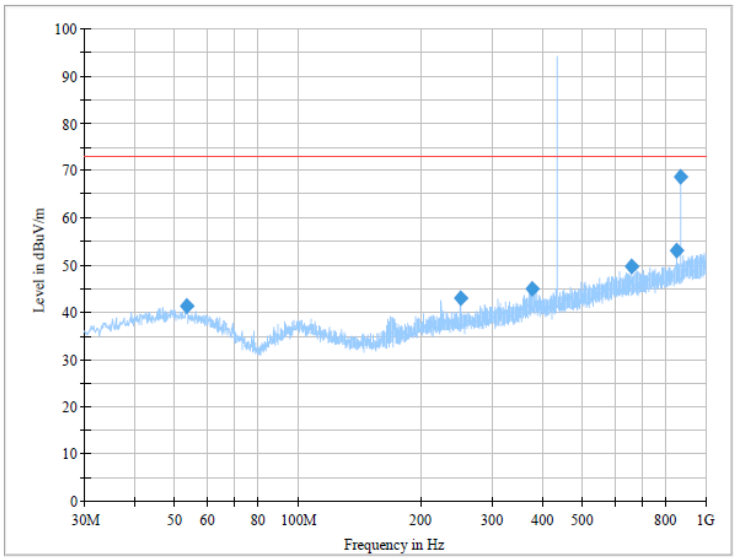


Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
83.956250	40.74	72.57	31.83	100.0	V	280.0	15.3
304.752500	41.37	72.57	31.20	100.0	V	45.0	21.5
363.922500	44.30	72.57	28.27	100.0	V	258.0	23.1
514.151250	47.43	72.57	25.14	100.0	V	74.0	26.1
850.135000	67.12	72.57	5.45	100.0	V	163.0	31.0
948.105000	53.18	72.57	19.39	100.0	V	34.0	32.0

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	850.13500	67.12	-33.85	33.27	52.57	-19.30	Vertical

Test channel	CH_{09}	Polarity	Horizontal

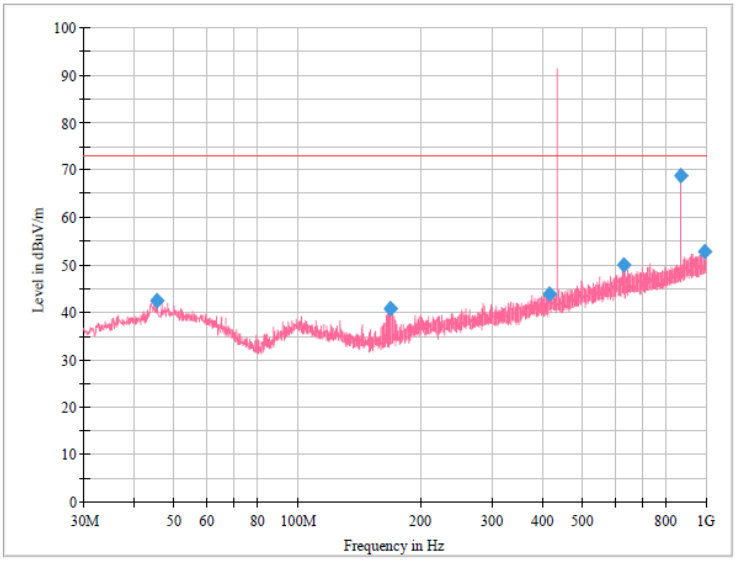


Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
53.401250	41.35	72.84	31.49	100.0	H	15.0	20.6
249.947500	42.89	72.84	29.95	100.0	H	0.0	20.1
375.077500	45.06	72.84	27.78	100.0	H	328.0	23.3
659.166250	49.75	72.84	23.09	100.0	H	6.0	28.5
847.710000	53.03	72.84	19.81	100.0	H	321.0	30.9
866.140000	67.08	72.84	5.76	100.0	H	44.0	31.2

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	866.14000	67.08	-33.85	33.23	52.84	-19.61	Horizontal

Test channel	CH_{09}	Polarity	Vertical

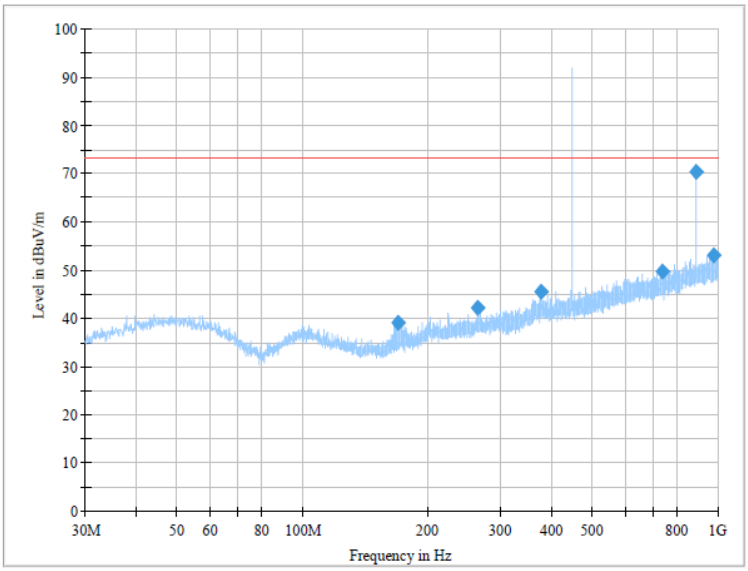


Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.156250	42.54	72.84	30.30	100.0	V	0.0	20.6
168.831250	40.74	72.84	32.10	100.0	V	287.0	16.3
412.543750	43.95	72.84	28.89	100.0	V	210.0	24.2
628.732500	50.11	72.84	22.73	100.0	V	239.0	28.2
866.018750	67.77	72.84	5.07	100.0	V	169.0	31.2
990.663750	52.89	72.84	19.95	100.0	V	181.0	32.2

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	866.01875	67.77	-33.85	33.92	52.84	-18.92	Vertical

Test channel	CH_{21}	Polarity	Horizontal

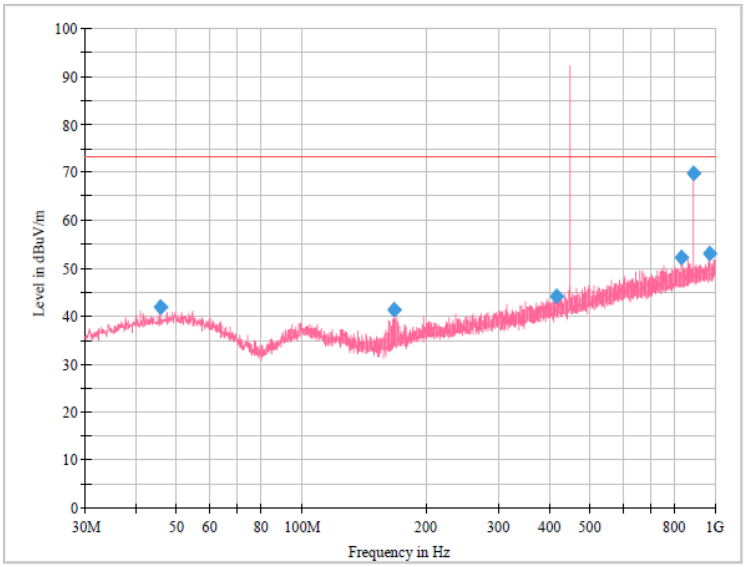


Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
169.801250	39.01	73.22	34.21	100.0	H	91.0	16.4
263.770000	42.08	73.22	31.14	100.0	H	332.0	20.4
375.077500	45.56	73.22	27.66	100.0	H	79.0	23.3
734.220000	49.85	73.22	23.37	100.0	H	109.0	29.3
890.147500	69.54	73.22	3.68	100.0	H	244.0	31.6
974.416250	52.95	73.22	20.27	100.0	H	343.0	32.1

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	890.14750	69.54	-33.85	35.69	53.22	-17.53	Horizontal

Test channel	CH_{21}	Polarity	Vertical



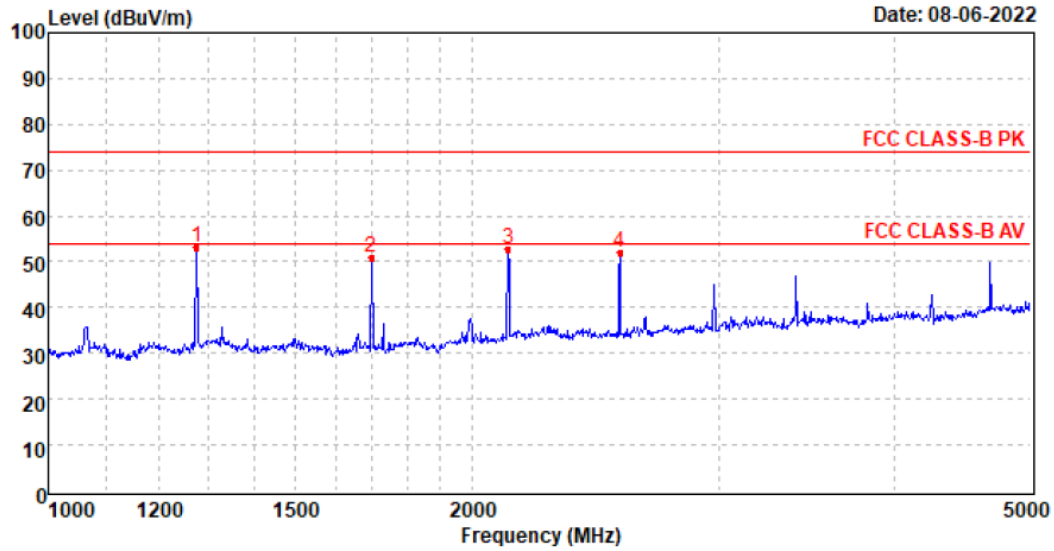
Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.520000	41.88	73.22	31.34	100.0	V	321.0	20.6
167.740000	41.35	73.22	31.87	100.0	V	310.0	16.3
414.726250	44.21	73.22	29.01	100.0	V	227.0	24.2
830.735000	52.12	73.22	21.10	100.0	V	161.0	30.7
890.026250	68.94	73.22	4.28	100.0	V	161.0	31.6
971.991250	52.96	73.22	20.26	100.0	V	150.0	32.1

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	890.02625	68.94	-33.85	35.09	53.22	-18.13	Vertical

FOR 1 GHz ~ 5 GHz

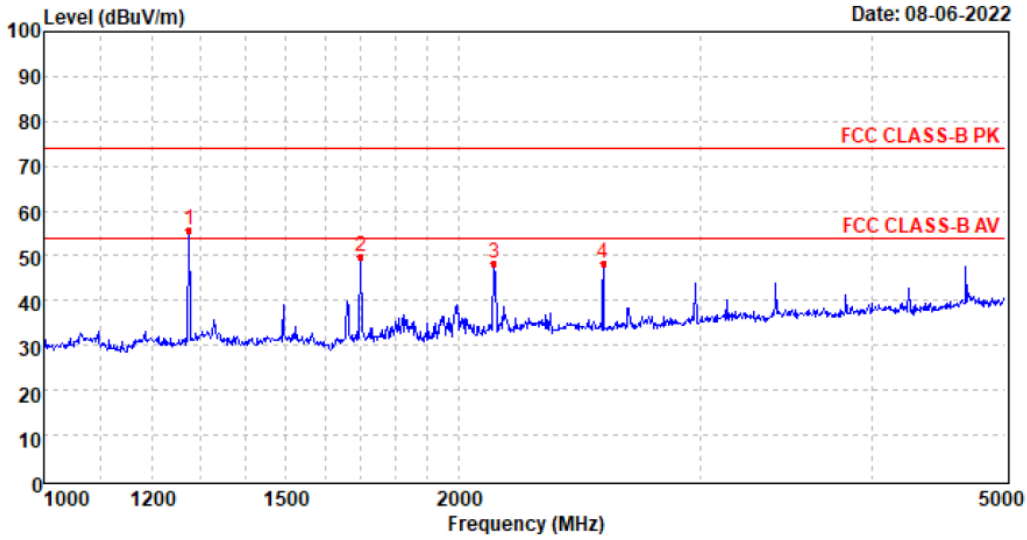
Test channel	CH_{01}	Polarity	Horizontal



Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	1275.10	60.65	25.95	2.83	36.40	53.03	74.00	-20.97	Peak
2	1698.09	59.82	25.10	3.28	37.10	51.10	74.00	-22.90	Peak
3	2123.82	58.80	27.39	3.71	37.30	52.60	74.00	-21.40	Peak
4	2551.53	57.66	27.40	4.19	37.15	52.10	74.00	-21.90	Peak

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBμV/m]	DCCF [dB]	Level [dBμV/m]	Limit [dBμV/m]	Over Limit [dB]	Polarity
1	1275.10	53.03	-33.85	19.18	54.00	-34.82	Horizontal
2	1698.09	51.10	-33.85	17.25	54.00	-36.75	Horizontal
3	2123.82	52.60	-33.85	18.75	54.00	-35.25	Horizontal
4	2551.53	52.10	-33.85	18.25	54.00	-35.75	Horizontal

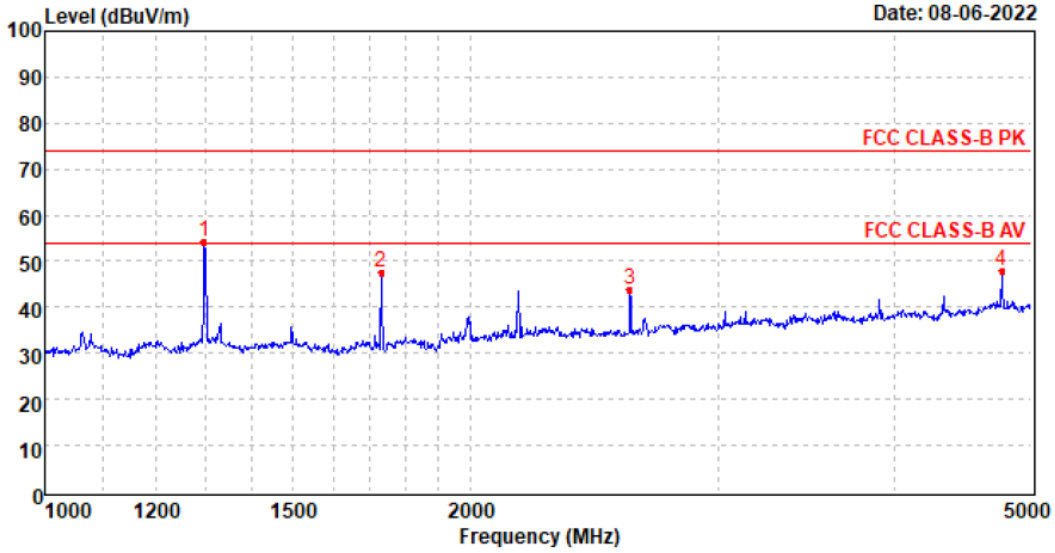
Test channel	CH_{01}	Polarity	Vertical



Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	1275.10	63.57	25.95	2.83	36.40	55.95	74.00	-18.05	Peak
2	1700.83	58.64	25.10	3.28	37.09	49.93	74.00	-24.07	Peak
3	2123.82	54.39	27.39	3.71	37.30	48.19	74.00	-25.81	Peak
4	2551.53	53.87	27.40	4.19	37.15	48.31	74.00	-25.69	Peak

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Over Limit [dB]	Polarity
1	1275.10	55.95	-33.85	22.10	54.00	-31.90	Vertical
2	1700.83	49.93	-33.85	16.08	54.00	-37.92	Vertical
3	2123.82	48.19	-33.85	14.34	54.00	-39.66	Vertical
4	2551.53	48.31	-33.85	14.46	54.00	-39.54	Vertical

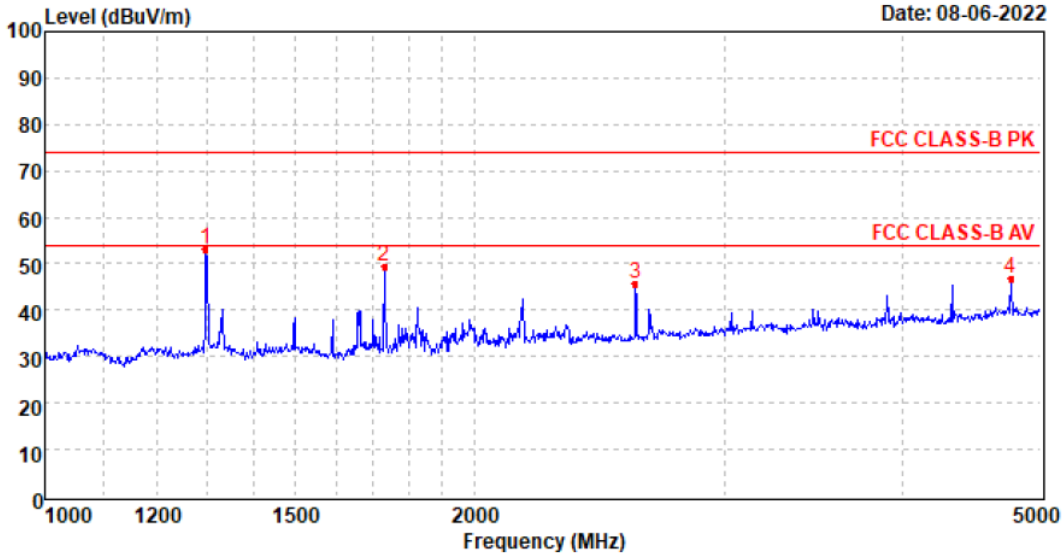
Test channel	CH_{09}	Polarity	Horizontal



Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	1297.88	61.68	26.00	2.84	36.30	54.22	74.00	-19.78	Peak
2	1731.21	56.17	25.16	3.33	37.15	47.51	74.00	-26.49	Peak
3	2597.10	49.28	27.49	4.32	37.09	44.00	74.00	-30.00	Peak
4	4764.32	46.47	31.40	5.70	35.45	48.12	74.00	-25.88	Peak

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBμV/m]	DCCF [dB]	Level [dBμV/m]	Limit [dBμV/m]	Over Limit [dB]	Polarity
1	1275.10	54.22	-33.85	20.37	54.00	-33.63	Horizontal
2	1698.09	47.51	-33.85	13.66	54.00	-40.34	Horizontal
3	2123.82	44.00	-33.85	10.15	54.00	-43.85	Horizontal
4	2551.53	48.12	-33.85	14.27	54.00	-39.73	Horizontal

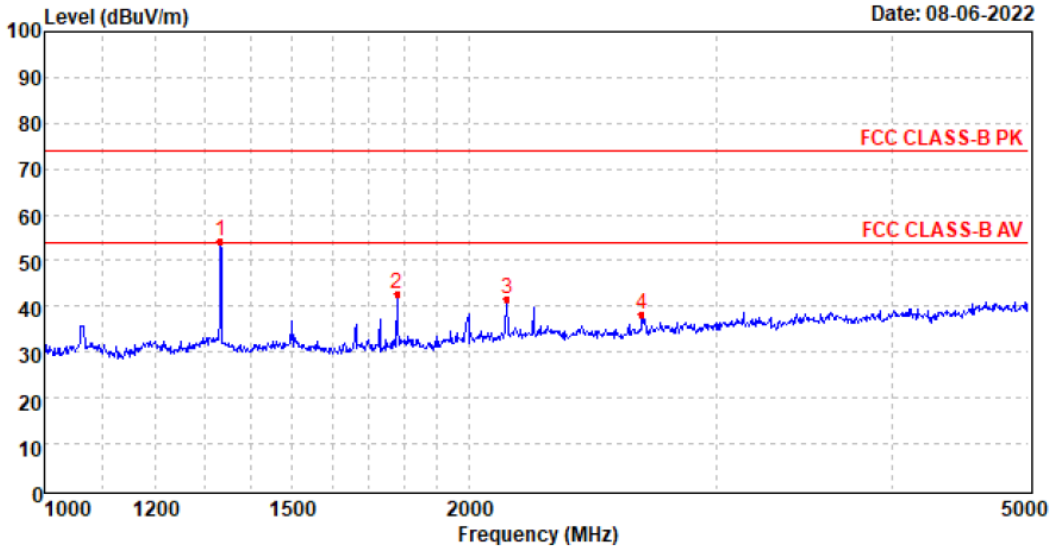
Test channel	CH_{09}	Polarity	Vertical



Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	1297.88	60.55	26.00	2.84	36.30	53.09	74.00	-20.91	Peak
2	1731.21	58.14	25.16	3.33	37.15	49.48	74.00	-24.52	Peak
3	2597.10	50.98	27.49	4.32	37.09	45.70	74.00	-28.30	Peak
4	4764.32	45.09	31.40	5.70	35.45	46.74	74.00	-27.26	Peak

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Over Limit [dB]	Polarity
1	1275.10	53.09	-33.85	19.24	54.00	-34.76	Vertical
2	1700.83	49.48	-33.85	15.63	54.00	-38.37	Vertical
3	2123.82	45.70	-33.85	11.85	54.00	-42.15	Vertical
4	2551.53	46.74	-33.85	12.89	54.00	-41.11	Vertical

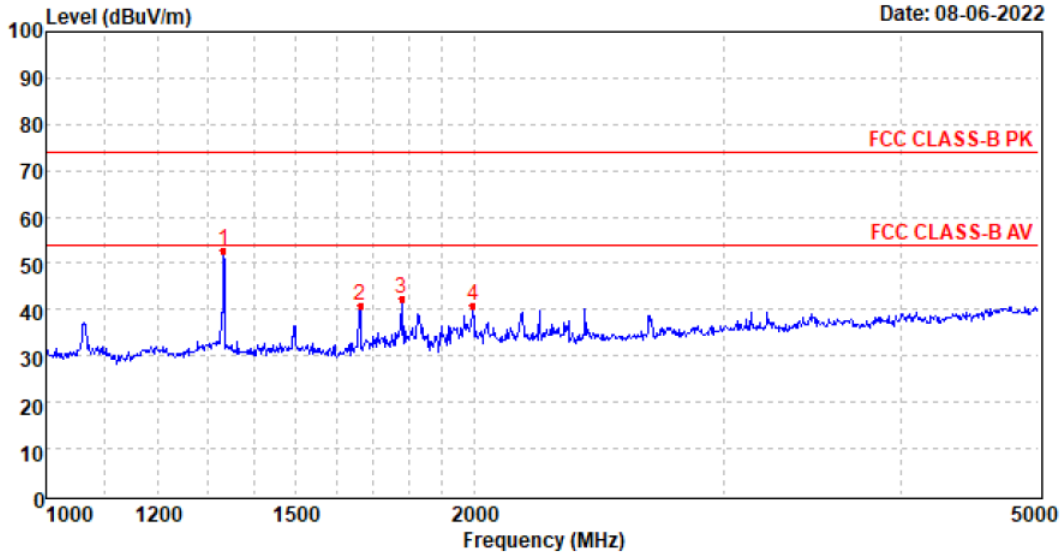
Test channel	CH_{21}	Polarity	Horizontal



Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	1333.88	61.44	26.20	2.91	36.38	54.17	74.00	-19.83	Peak
2	1779.23	50.91	25.32	3.41	37.06	42.58	74.00	-31.42	Peak
3	2130.67	47.95	27.47	3.71	37.32	41.81	74.00	-32.19	Peak
4	2656.29	43.26	27.74	4.24	37.01	38.23	74.00	-35.77	Peak

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBμV/m]	DCCF [dB]	Level [dBμV/m]	Limit [dBμV/m]	Over Limit [dB]	Polarity
1	1275.10	54.17	-33.85	20.32	54.00	-33.68	Horizontal
2	1698.09	42.58	-33.85	8.73	54.00	-45.27	Horizontal
3	2123.82	41.81	-33.85	7.96	54.00	-46.04	Horizontal
4	2551.53	38.23	-33.85	4.38	54.00	-49.62	Horizontal

Test channel	CH_{21}	Polarity	Vertical

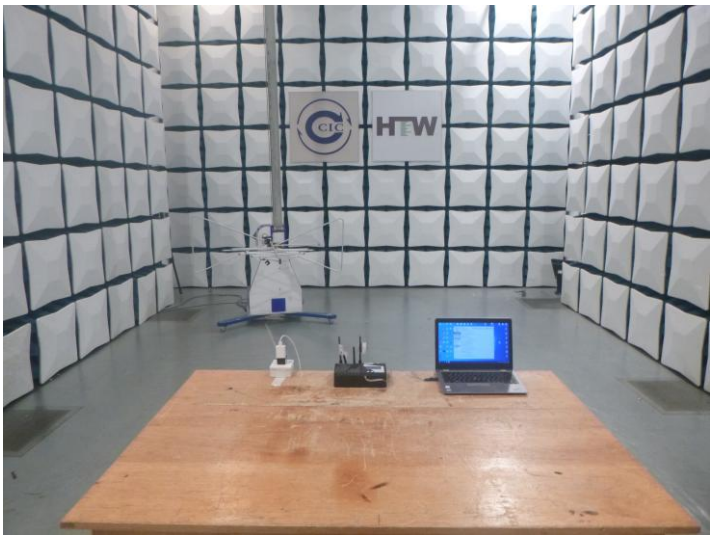


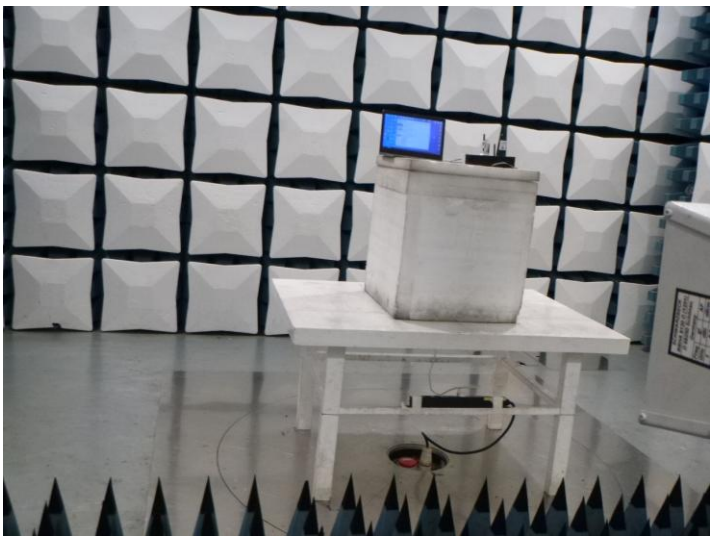
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	1333.88	60.09	26.20	2.91	36.38	52.82	74.00	-21.18	Peak
2	1665.61	49.62	25.10	3.25	37.18	40.79	74.00	-33.21	Peak
3	1779.23	50.64	25.32	3.41	37.06	42.31	74.00	-31.69	Peak
4	1997.82	48.14	26.09	3.62	37.07	40.78	74.00	-33.22	Peak

Spurious Emission of Average							
No.	Freq. [MHz]	PK level [dBµV/m]	DCCF [dB]	Level [dBµV/m]	Limit [dBµV/m]	Over Limit [dB]	Polarity
1	1275.10	52.82	-33.85	18.97	54.00	-35.03	Vertical
2	1700.83	40.79	-33.85	6.94	54.00	-47.06	Vertical
3	2123.82	42.31	-33.85	8.46	54.00	-45.54	Vertical
4	2551.53	40.78	-33.85	6.93	54.00	-47.07	Vertical

6. TEST SETUP PHOTOS

Radiated Emission





AC Conducted Emission

7. EXTERNAL AND INTERNAL PHOTOS

Reference to the test report No.: CHTEW22080302

8 . APPENDIX REPORT

APPENDIX REPORT

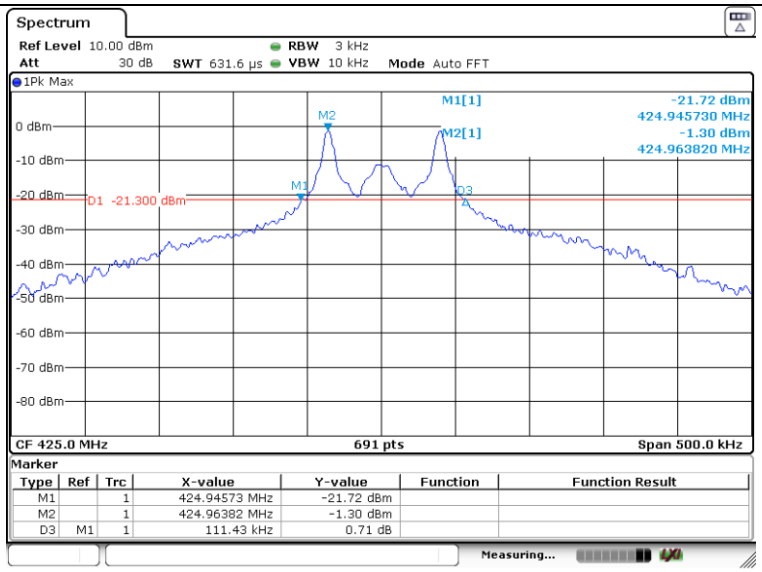
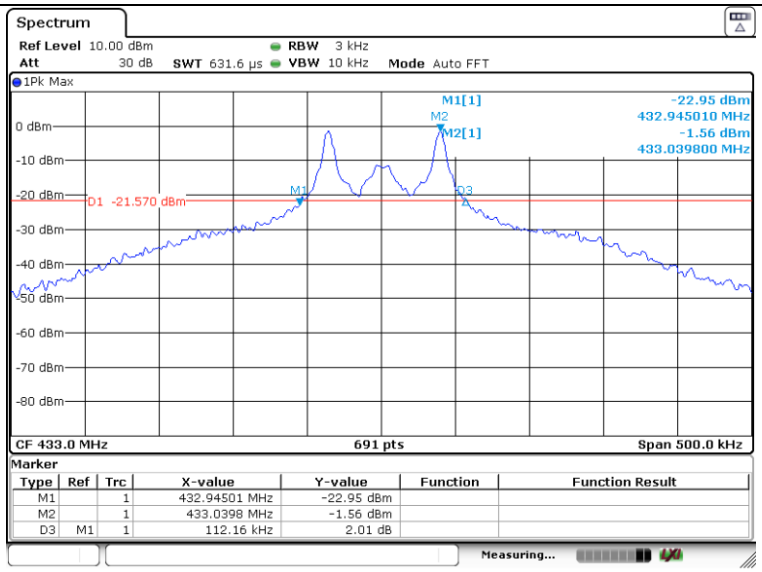
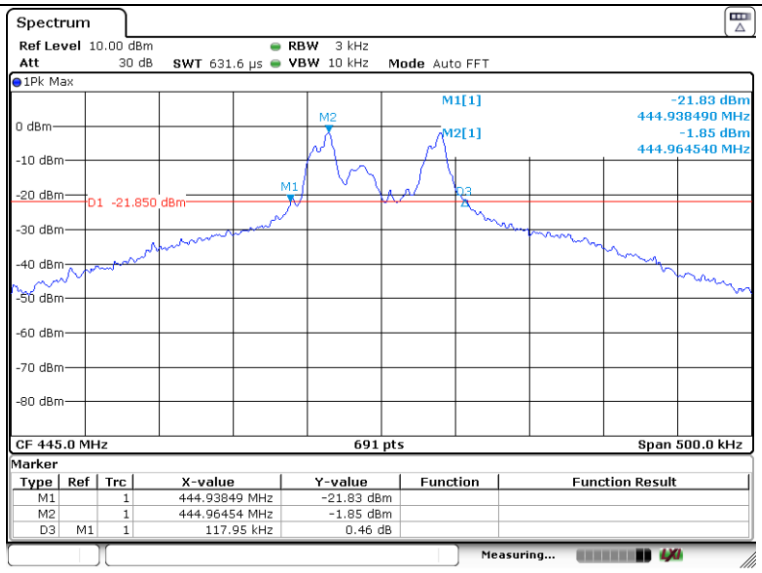
Project No.	SHT2207038406EW		
Test sample No.	YPHT22070384014	Model No.	MT1100
Start test date	2022-07-30	Finish date	2022-10-12
Temperature	23.6℃	Humidity	43%
Test Engineer	Xiaoqin Li	Auditor	Xiaodong Zhao

Appendix clause	Test item	Result
A	20dB Bandwidth	PASS
B	Deactivation Time	PASS
C	Duty Cycle Corrected Factor	PASS

Appendix A：20dB bandwidth

Test Channel	20dB Bandwidth (kHz)	Limit (kHz)	Result
CH_L	111.43	1062.50	Pass
CH_M	112.16	1082.50	Pass
CH_H	117.95	1112.50	Pass

NOTE:Limit=0.25%*Center Frequency

CH_L	 Date: 11.OCT.2022 16:40:05
CH_M	 Date: 11.OCT.2022 16:39:15
CH_H	 Date: 11.OCT.2022 16:37:12

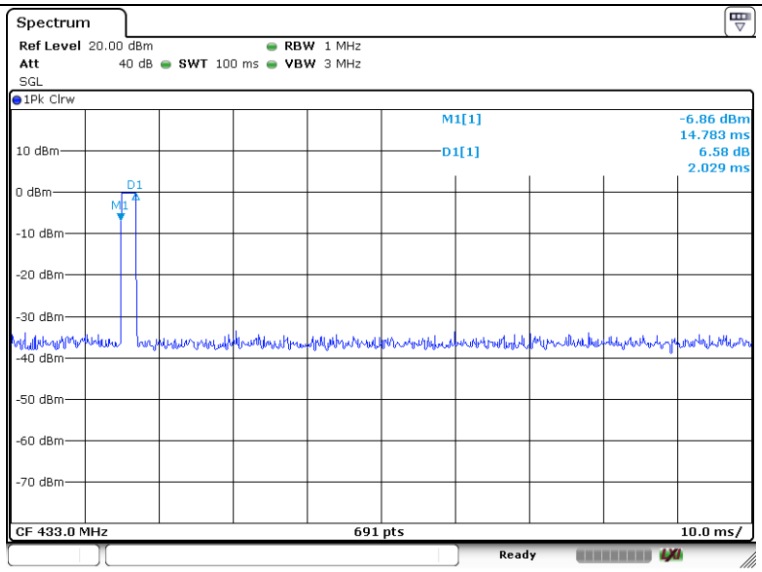
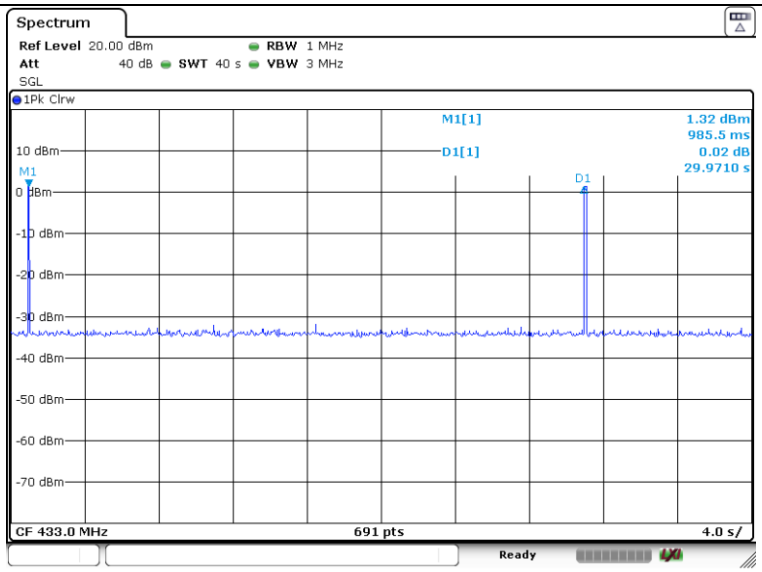
Appendix B：Deactivation Time

	Transmission time (second)	Limit (second)	Result
T_{ON}	0.002	1	Pass
T_{OFF}	29.97	0.06s< T_{OFF} T_{OFF}>10s	

NOTE: Limit: T_{ON}<1s

30* T_{ON} <T_{OFF}

30* T_{ON}= 30*0.002s = 0.06s

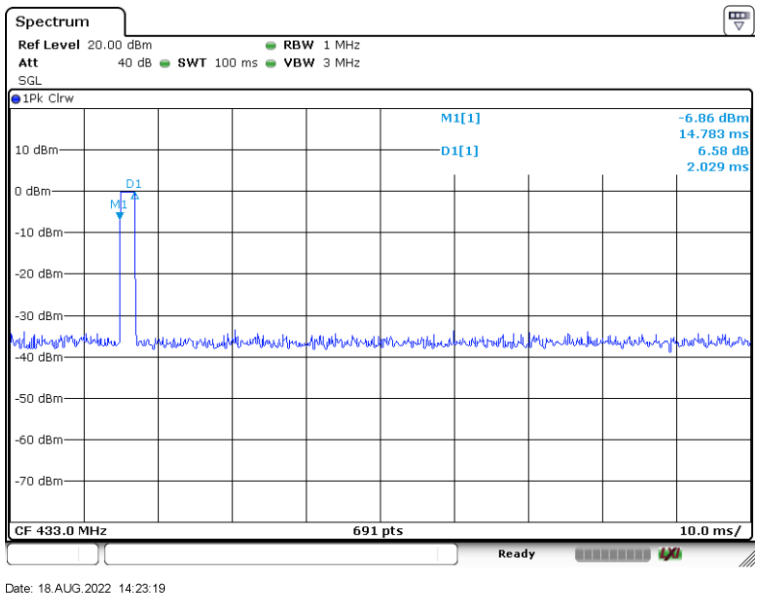
CH_M	 Spectrum Ref Level 20.00 dBm RBW 1 MHz Att 40 dB SWT 100 ms VBW 3 MHz SGL 1Pk Clrw M1[1] -6.86 dBm 14.783 ms D1[1] 6.58 dB 2.029 ms 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 433.0 MHz 691 pts 10.0 ms/ Ready Date: 18.AUG.2022 14:23:19  Spectrum Ref Level 20.00 dBm RBW 1 MHz Att 40 dB SWT 40 s VBW 3 MHz SGL 1Pk Clrw M1[1] 1.32 dBm 985.5 ms D1[1] 0.02 dB 29.9710 s 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 433.0 MHz 691 pts 4.0 s/ Ready Date: 11.OCT.2022 16:49:03

Appendix C：Duty Cycle Corrected Factor

T_{ON1} (ms) :	2.029
T_{ON1} number	1
Period (ms) :	100
Duty Cycle :	=(2.029*1)/100= 0.02029
Duty Cycle Corrected Factor:	=20*log(0.02029)= -33.85

Note：

1) Duty cycle= Ton1* T_{ON1} number / Tperiod
2) Duty Cycle Corrected Factor/DCCF=20*log (Duty Cycle)

CH_M	

--------End of Report--------